

DETERMINATION OF TRYPTOPHANE IN FODDERS AND RAW MATERIALS BY CAPILLARY ELECTROPHORESIS

INTRODUCTION

The method enables fast quantitative determination of amino acid tryptophane in feeds, mixed fodders, and raw materials.

MEASURING METHOD

Capillary electrophoresis for the determination of tryptophane is based on differential migration of its ionic form in a narrow quartz capillary under the influence of the applied electric field. Identification of tryptophane is made by measuring its own absorbance at 219 nm wavelength in a borate buffer at 40 °C.

CONCENTRATION RANGES

Measuring range in percentage for tryptophane is **0.1–2.0 % (w/w)** of the analyzed fodder. The presence of other amino acids does not influence its determination.

ADVANTAGES OF CAPILLARY ELECTROPHORESIS

Capillary electrophoresis has several advantages in comparison with the method of amino acids determination in mixed fodders by amino acid analyzers:

- Absence of derivatization
- Low analysis cost
- Absence of an expensive chromatographic column
- Short analysis time
- Expensive chromatography column is not needed

EQUIPMENT AND REAGENTS

The following equipment and reagents are used in measurements:

- CAPEL®-105 Capillary electrophoresis system with a special capillary cassette for the amino acid analysis
- Distilled deionized water
- Sodium hydroxide
- Hydrochloric acid
- Sodium tetraborate
- *L*- or *D,L*-Tryptophane
- Barium hydroxide

All reagents must be of analytical grade or better.

Data acquisition and integration is accomplished with PC with Windows® 95/98/NT/ME/2000/XP, using "Chrom&Spec® for Windows®" chromatographic software.

PREOPERATIONAL PROCEDURES

Preoperational procedures include: sampling and sample preparation, capillary conditioning, preparation of auxiliary and calibration solutions, and calibration of the CAPEL® Capillary Electrophoresis System.

MEASUREMENT PROCEDURE

Sampling is accomplished in accordance with the standard certified protocol.

Capillary conditioning is done by rinsing the capillary consequently by 1M hydrochloric acid, water, 1M sodium hydroxide, water and background electrolyte.

Basic hydrolysis of fodder sample is done according to a certified protocol in closed containers with 1.5 M barium hydroxide for 16 hours at 110 °C. After removal of the excess of the base the treated solution is analyzed by capillary electrophoresis in accordance with a program that is preset in CAPEL®-105 system.

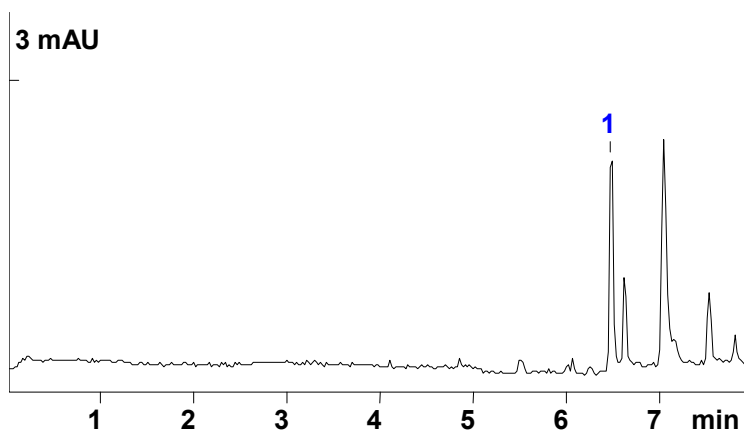


DATA PROCESSING

Data analysis, integration and calculation of tryptophane concentrations is done by the "Chrom&Spec[®] for Windows[®]" software.

EXAMPLES OF REAL ANALYSIS

Sample: fish flour (100 mg)
1 – tryptophane (0.78%)



Sample: meat-bone flour (100 mg)
1 – tryptophane (0.52%)

